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The United Nations Environment Programme and the marine litter challenge

A short overview of activities of the United Nations Environment Programme related to addressing the problem of marine litter

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Summary

The present document presents a short overview of the marine litter issue and is organized in the following sections: the problem; lost and abandoned fishing gear and related debris; relevant activities of the United Nations Environment Programme; an overview of activities of regional seas programmes on marine litter; and possible ways forward.

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I. The problem

1. Marine litter is found in all sea areas of the world — not only in densely populated regions, but also in remote places far away from any obvious sources. Studies from various parts of the world have confirmed that marine litter is found everywhere in the marine and coastal environment, from the poles to the equator and from continental coastlines to small remote islands. Marine litter originates from many sources and has a wide spectrum of environmental, economic, safety, health and cultural impacts. Considering the very slow rate of degradation of most marine litter items, a continuous input of large quantities of marine litter will result in a gradual increase of litter in the coastal and marine environment. This negative trend has been confirmed by a number of studies in various regions.

2. Despite efforts made internationally, regionally, nationally and many times locally, there are indications that the marine litter problem keeps growing worse. As long as the input of non-degradable litter into the marine environment continues, the result will be increased quantities of marine litter in the coastal and marine environments. Deficiencies in the implementation and enforcement of existing international, regional and national regulations and standards that could improve the situation, combined with a lack of awareness among main stakeholders and the general public, are other major reasons that the marine litter problem not only persists but appears to be increasing worldwide.

Sources of marine litter

3. Marine litter comes from both sea-based sources and land-based sources and it is obvious that measures to reduce or prevent it in the marine and coastal environment have to be taken in many communities, as part of a large number of activities over a wide range of societal sectors, and by many individuals in many different circumstances. The main sea-based sources of marine litter are merchant shipping, ferries and cruise liners, fishing vessels (mainly as a source of abandoned or lost fishing gear), military fleets, research vessels, pleasure craft, offshore oil and gas platforms and aquaculture installations. The main land-based sources of marine litter are municipal landfills (waste dumps) located on the coast, riverine transport of waste from landfills and other sources, discharges of untreated municipal sewage and storm water, industrial facilities, medical waste and tourism (recreational visitors, beach goers).

Quantities

4. Owing to the lack of systematic and comprehensive surveys on the quantities of marine litter on both global and regional scales, only selected information from different parts of the world, collected through a literature search, can be presented here. In 1997, the United States Academy of Sciences estimated the total input of marine litter into the oceans, worldwide, at approximately 6.4 million tonnes per year, of which nearly 5.6 million tonnes were estimated to come from merchant shipping. According to other calculations, some 8 million items of marine litter have been estimated to enter oceans and seas every day, about 5 million of which (solid waste) are thrown overboard or lost from ships. Furthermore, it has been estimated that over 13,000 pieces of plastic litter are floating on every square kilometre (km) of ocean today. In 2002, in the central Pacific gyre, there were found to be six kilograms (kg) of plastic for every kilogram of plankton near the surface.

5. The Ocean Conservancy (a United States non-governmental organization) has been organizing every year in September International Coastal Clean-up campaigns. In 2002, over 390,000 volunteers in 100 countries took part in these campaigns. They removed marine litter from more than 21,000 km of coastline and waterways, collecting more than 6.2 million pieces of marine litter, weighing over 4,000 tonnes. Almost 58 per cent of the coastal marine litter found could be attributed to shoreline and recreational activities, such as beach-picnicking and general littering. Many other such clean-up operations are carried out every year by thousands of schoolchildren, volunteers and local authorities in a large number of countries in all parts of the world.

6. During one decade (1992-2002), over 73,000 m^3 of marine litter had been gathered on some 300 km of rocky shores on the Swedish west coasts (including thousands of islands and islets), i.e. the easternmost part of the North Sea. The average annual amount of litter cleaned up on those beaches is 6,000 to 8,000 m^3 (20-26 m^3 per km). Using figures from the North Sea and the waters around Australia, as well as from other places, it has been estimated that up to 70 per cent of the marine litter that enters the sea ends up on the seabed, whereas half of the remaining amount (i.e. 15 per cent) is found on beaches and the rest (another 15 per cent) floats on the water surface.

Effects of marine litter

7. Marine litter is an environmental, economic, health and aesthetic problem. It kills, injures and causes pain and suffering. It is a vicious killer of wildlife. Entanglement and ingestion are the primary kinds of direct damage to wildlife caused by it. Sea Life Surveys scientists estimate that globally, more than 1 million birds and 100,000 marine mammals and sea turtles die each year from entanglement in, or ingestion of, plastics. Other threats to the marine and coastal ecosystems from marine litter include smothering of the seabed and disturbance of habitats from mechanical beach cleaning. Plastic litter is increasingly believed to be a source of persistent toxic substances. Pieces of marine litter can also transport invasive species between seas. Medical and sanitary waste constitutes a health hazard and can seriously injure people. Every year, marine litter entails great economic costs and losses to people and communities around the world. It spoils, fouls and destroys the beauty of the sea and the coastal zone.

8. Damage to people, property and livelihoods caused by marine litter can be grouped into a number of general categories. These include damage to fisheries, fishing boats and gear, damage to cooling water intakes in power stations, contamination of beaches (requiring cleaning operations), contamination of commercial harbours and marinas (demanding cleaning operations) and contamination of coastal grazing land, causing injury to livestock. Problems with propeller fouling, blocked intake pipes and damaged drive shafts have been reported. According to two studies made in 1976 and 1978 in the Bering Sea and the Gulf of Alaska, 40 to 60 per cent of bottom trawls collected plastic and metal debris. Marine litter-related damage to people also includes safety risks at sea (demanding rescue services) owing, inter alia, to fouling of propellers, as well as damage to people's health (injuries, disease) from litter on beaches and in bathing water, including medical waste.

Costs and economic damage

9. Only a few economic assessments have been made of the costs and financial damage caused by marine litter to municipalities or to specific activities such as fisheries. In a report published by the Kommunenes Internasjonale Miljoorganisasjon, Local Authorities International Environmental Organisation (KIMO) based in Shetland, United Kingdom, it was estimated that the annual cleaning cost to 56 local communities in the United Kingdom was US$ 3.9 million. This cleaning campaign covered 900 km of the coastline and 10,000 tonnes of waste were collected. On the basis of this information it is easy to extrapolate that the cost for cleaning the coastlines of Europe or even the world would be enormous. Swedish municipalities on the country's west coast (facing the North Sea) spend an estimated $1.6 million on cleaning beaches each year (involving only about 3,600 km). In 1999, Orange County in California, United States of America, collected garbage every week from a six-mile (nearly 10 km) stretch of beach at a cost to taxpayers of $350,000. Other counties spent even more. About $12 million was spent in the Republic of Korea during 2003 on issues related to marine litter.

10. According to a KIMO report, the total cost of marine litter in Shetland (the islands in the extreme north-east of the United Kingdom), assuming that all parties affected were hit equally badly, could be in the range of $9.9 million per year. The cost to the fishing industry could be $8.7 million. Bearing in mind that the Shetland coastline represents only a fraction of the European total, the costs could run into billions of dollars if this approximation was extended to cover coastal communities throughout Europe. In a survey conducted in Newport, Oregon, United States of America, 58 per cent of the fishermen indicated that they had experienced vessel problems owing to plastic debris and incurred an average expense of $2,725 per vessel. Based on statistics of damage insurance for fishing vessels in Japan, the leading cause of engine damage is due to plastic at sea. Insurance companies estimate that a total of $50 million has been awarded for repairs from damage incurred by marine litter.

Challenges in preventing and combating marine litter

11. Marine litter is not an environmental problem that can be solved solely by means of legislation, law enforcement and technical solutions. It is also a cultural problem and has to be addressed as such, namely through efforts to change attitudes and behaviours, through management approaches and education and through involvement of all sectors and interests, including the public at large.

12. There is a need to differentiate between measures aimed at preventing marine litter at the source and measures taken to deal with marine litter once it is already present in the marine and coastal environment. Preventive measures include, inter alia, better waste management on land and at sea and education and awareness-raising activities to influence behaviours. Measures to deal with already existing marine litter include beach, water column and sea-bottom clean-up operations and projects to allow fishing vessels to leave ashore marine litter caught in fishing gear without having to pay any garbage fee (or even to encourage such collection of floating and suspending plastics).

13. Today, in many countries, there is a lack of appropriate management of waste, from the source where the waste is produced through to its final disposal or processing. However measures to reduce or prevent marine litter should be a part of

waste management in society as a whole. People who are "waste-wise" in general and who realize that waste is a common problem and not one that "someone else should take care of" will have the same responsible attitude that would eventually reduce marine litter. The first step in good waste management must begin with preventing waste from being generated — what is never produced does not have to be disposed of and cannot become marine litter. The second step is to collect waste that has already been generated and make sure it is being taken care of properly, either for reuse and recycling of materials and products (to the extent possible) or for disposal in a manner that is safe from an environmental and health point of view.

14. Marine litter should be included in global and regional agreements, action plans, initiatives and negotiations and in national legislation. It is also an issue that is connected to other marine environmental, economic and health problems, including the possible distribution of toxic substances, the destruction of marine habitats and biodiversity, and the transfer of invasive species.

15. Education, information and training are vital components in all efforts towards more waste-wise thinking in society as a whole. Education and training are needed for many sectors of society and the general public in order to raise awareness about everyone's responsibility to prevent marine pollution. Education on the sources and effects of marine litter and ways of reducing the problem at the source needs to be incorporated into curriculums at various levels in the educational sector.

16. A wide range of marine litter-related instruments already exist and actions are being taken at the global and regional levels. Nationally, a number of countries have taken comprehensive action to address the marine litter issues through legislation, enforcement of international agreements, providing reception facilities for ship-generated wastes, improving their waste management practices and supporting extensive beach clean-up activities, as well as information, education and public awareness programmes. Thus, much is already being done, though it is obviously not enough.

II. Lost and abandoned fishing gear and related debris

17. Lost or abandoned fishing gear is a significant and very persistent form of marine litter. It poses a threat to the marine environment, as well as to human life and activities. The United Nations Environment Programme (UNEP) Regional Seas Programme recognizes the immediate and direct interconnection between marine litter and lost and abandoned fishing gear and related debris. It also puts significant emphasis on the development of solutions on the basis of international and inter-agency cooperation within the framework of a broader marine litter initiative. UNEP considers the Food and Agriculture Organization of the United Nations (FAO) and its related Regional Fishery Bodies, with their long experience in the area of fisheries, as a significant element of this cooperative process on the issue.

18. Once discarded or lost, the fishing gear remains in the marine environment, with negative economic and environmental impacts. Lately, lost and abandoned fishing gear has increasingly become a worldwide "high-profile" nuisance. In the UNEP feasibility study on sustainable management of marine litter of 2004, it is reported that in 2002, the United States National Oceanic and Atmospheric Administration collected 107 tonnes of nets and lines and other fishing gear on the Pearl and Hermes Atoll (northern Hawaiian Islands) alone. In 2003, another 90

tonnes were found near that atoll and the Midway Islands. Other statistics or estimates on quantities are hard to find, but it is assumed that hundreds of thousands of tonnes (or even more) of undegradable fishing nets are abandoned or lost in the world's oceans every year.

19. Fishing gear can inflict lethal cuts and wounds on fish and marine wildlife. When wrapped around limbs and fins, it can cause circulation loss and amputation, especially as the animal grows. Of the different types of marine mammals, seals and sea lions are the most affected (particularly by entanglement). It is estimated that some 100,000 marine mammals die every year from entanglement or ingestion of fishing gear and related marine debris. According to the United States Marine Mammal Commission, 136 marine species have been reported in entanglement incidents in the wider United States area, including 6 species of sea turtles, 51 species of seabirds and 32 species of marine mammals (Marine Mammal Commission, 1996). Based on recent entanglement studies, estimates suggest that about 1,500 seals die from entanglement each year in Australia (Page et al., 2003).

20. Nearly a million seabirds are thought to die from entanglement or ingestion of floatable material each year. Seabirds are some of the most frequent victims of abandoned nets or longlines. In addition, lost or abandoned gear can continue trapping fish for a long period out of the fisherman's control. Such an uncontrolled, unproductive process is known as "ghost fishing". Quantifying the loss of marine resources owing to "ghost nets" is difficult, but several studies on static gears have shown it to be about 10 per cent of the target population. Ghost fishing, through lost or discarded nets and lost underwater traps, kills thousands of tonnes of fish that might otherwise have found their way to the market. An estimated $250 million in marketable lobster is lost each year from "ghost fishing".

21. Within the broader scope of marine litter, the problem of lost and abandoned fishing gear requires more specific and sectoral solutions. Possible remedies to the problem may include the following directions: (a) quantification and understanding of the problem; (b) recovery of lost gear; (c) reception and collection of used and old gear; (d) prevention through education and regulation; (e) development of compensation systems for fishermen returning used fishing gear; and (f) review of fishing gear materials and development of new technologies.

22. Putting prominent emphasis on the effort to address the issue of lost or abandoned fishing gear within the wider context of marine litter, the UNEP Regional Seas Programme can act as a platform for developing common regional objectives and promoting synergies and coordinated regional implementation. This already takes place through the relevant Multilateral Environmental Agreements, global and regional initiatives and United Nations agencies, such as the International Maritime Organization (IMO), the Intergovernmental Oceanographic Commission (IOC) of the United Nations Educational, Scientific and Cultural Organization (UNESCO), the secretariat of the Basel Convention, FAO and the Regional Fishery Bodies, the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) and the UNEP Division of Technology, Industry and Economics, as well as other international actors. Marine litter (e.g. discarded fishing gear) could be one issue for strengthened cooperation between the FAO Regional Fishery Bodies and the UNEP Regional Seas Programme in various parts of the world.

III. Relevant activities of UNEP

23. UNEP and its Regional Seas Programme and the Global Programme of Action have been developing and implementing a number of activities on the management of marine litter.

24. In 2004, UNEP initiated a feasibility study on sustainable management of marine litter (see para. 18 above). The study is a major attempt on the part of the Regional Seas Programme to assess the need, as well as the benefits and the challenges of programmes or initiatives, for the reduction and management of marine litter and to assess the benefits of implementing such projects in particular regions. The document addresses the problem of marine litter, as well as the measures to prevent the problem, and contains an analysis of the situation and proposals for action. The main results of the UNEP feasibility study on marine litter were published as a separate document.

25. In view of the magnitude and the severity of the marine litter problem, and after a series of consultations with IMO, UNESCO/IOC, FAO, the Basel Convention secretariat, the Mediterranean Action Plan and internal consultations with the Global Programme of Action and the United Nations Environment Programme Division of Technology, Industry and Economies, UNEP is considering developing a broader approach to deal with marine litter. This approach would be based on regional activities (such as developing regional action plans) and on substantive cooperation with the other agencies.

26. A leaflet on marine litter, entitled "Tightening the noose", was also published recently by UNEP. As mentioned earlier, in order to address the global and transboundary problem of marine litter, an interdisciplinary, multisectoral and holistic approach should be taken. With a view to addressing the problem, the Regional Seas Programme is considering initiating a Global Environment Facility medium-sized project aimed to develop a broader, more comprehensive approach to the sustainable management of marine litter. This initiative would provide a platform for inter-agency cooperation and coordination of activities for the control and management of marine litter and derelict fishing gear as part of the project.

27. As marine litter is found in all sea areas of the world, this proposed project would concentrate first on pilot regions that are particularly affected. It would also try to develop a platform for cooperation and coordination of activities for the control and management of marine litter on a wider scale. Moreover, the project would establish the necessary regional foundations and the regional and national capacities, assisted by various United Nations agencies, to address the problem. The results of this project, through activities in pilot regions, will allow further development of inter-agency and trans-regional initiatives to address the global problem of marine litter.

28. Until such time as the Global Environment Facility medium-sized project is fully developed and implemented, the UNEP Regional Seas Programme is developing additional regional activities relevant to the sustainable management of marine litter in consultation and cooperation with other United Nations agencies. The aim of these activities is to "prepare the ground" for the development of the project in selected regions, the Mediterranean, the Caribbean, the Black Sea, the Northwest Pacific region and the South Asian Seas.

29. The sustainable management of marine litter is a perfect illustration of a global and transboundary marine environmental problem and for this reason it is anticipated that the United Nations system will be instrumental in tackling this global challenge.

IV. Overview of activities of regional seas programmes on marine litter

30. The following are reports received from individual regional seas programmes on their respective activities vis-à-vis the problems of marine litter and abandoned fishing gear.

Mediterranean Action Plan

31. Pollution caused by discharge of solid wastes and litter into the sea is a significant cause of degradation of both the land and marine coastal fringe in the Mediterranean.

32. The Programme for the Assessment and Control of Pollution in the Mediterranean Region (MED POL), the marine pollution assessment and control component of the Mediterranean Action Plan/Barcelona Convention, recently prepared an assessment of the situation related to coastal litter in the Mediterranean. The study shows that the major source of litter into the marine environment is from coastal urban centres owing to the lack of coastal solid waste management, to inadequate management or to the failure of such management. Coastal urban centres are generating annually 30 to 40 million tonnes of municipal solid waste. The generation of solid waste is estimated to be 254 kg per person yearly, with an annual generation growth of 2 to 3 per cent. The main source is direct disposal by households, followed by the impact of tourist facilities and run-off from waste dumps (waste from land sources). This means that, in fact, the majority of marine waste comes from coastal areas. The sources of marine waste vary from one country to another.

33. The main findings of the MED POL assessment of coastal litter in the Mediterranean are:

- Solid waste management in the coastal strips is generally not covered by the national environment policy
- Solid waste management policies in coastal strips are implemented under the national health policy
- Most coastal urban centres do not have a municipal policy for solid waste management
- The municipalities' strategy regarding solid wastes is to satisfy the public hygienic standards
- Municipalities are lacking qualified solid waste managers. The issue is much more evident in small and medium-sized urban centres
- Environment authorities lack reliable information on solid waste management issues. There are large gaps in the regional information system for solid waste management

- Decision makers are bombarded by contradictory information provided for purely commercial reasons. The two major sources of solid waste in the marine environment are urban centres (up to 75 per cent) and commercial and tourist activities
- For economic and technical consideration, it seems that the sea is still considered as the most common disposal site. Sea disposal of solid wastes is still a common practice for small and medium-sized urban centres
- Solid wastes reach the sea through a wash-out process from poorly located/ rehabilitated landfills.

On the basis of the assessment and the guidelines prepared, the MED POL Programme developed a pilot project for coastal litter management in a number of locations in Lebanon. The outputs and deliveries of this project will be used to replicate it elsewhere in Lebanon and in other Mediterranean cities. This project is jointly implemented by MED POL, local authorities, local non-governmental organizations (NGOs) and RAMOGE.

Northwest Pacific Action Plan

34. Marine litter has become an issue of concern in the Northwest Pacific region because it is linked to other marine environmental, economic, health and aesthetic problems, including possible transfer of toxic substances and invasive species, destruction of marine habitats and loss of biodiversity. The members of the Northwest Pacific Action Plan (NOWPAP) adopted a resolution at the Ninth Intergovernmental Meeting (Busan, Republic of Korea, 2-4 November 2004) to develop a joint initiative to prevent and reduce marine litter in the marine and coastal environment and its harmful and costly effects. In the NOWPAP region therefore the marine litter activity is presently at the development stage, with the aim of initiating work in 2005. The overall objective of the currently scheduled project is to seek sustainable management of marine litter in the NOWPAP region in line with the sources, quantities and adverse effects of marine litter. This information will be collected during the implementation stage in the biennium 2005-2007.

Caribbean Environment Programme

35. Currently, the Caribbean Regional Coordinating Unit within the Caribbean Environment Programme of UNEP does not have any specific national or regional projects that deal exclusively with marine litter. However, activities under the Assessment and Management of Environmental Pollution subprogramme (including the Land-based Sources of Marine Pollution Protocol) and those that promote the implementation of the Specially Protected Areas and Wildlife Protocol are directly related to marine litter. These include assessments of marine litter as a land-based pollutant and its impact on critical coastal and marine ecosystems.

36. In this context, the following ongoing and new initiatives are highlighted: (a) promotion of the integrated management of solid and hazardous wastes and an integrated life-cycle approach to the management of chemicals in the Wider Caribbean region; (b) Regional Network in Marine Science and Technology for the Caribbean; (c) second regional overview of land-based sources and activities in the Wider Caribbean region; (d) development of National Programmes of Action

Demonstration Projects; (e) International Coral Reef Action Network in the Wider Caribbean region; and (f) conservation and sustainable use of coastal and marine ecosystems.

37. Marine litter activities in many of the countries of the Wider Caribbean region and in particular for the small island developing States are limited to periodic beach clean-up and community clean-up exercises that are coordinated by local NGOs, schools, private sector organizations, dive associations, tourism authorities, hotels, solid waste management agencies, community groups, environmental departments, coastal zone agencies and/or departments of fisheries. These are often associated with commemorative events, such as National Clean-up Day, Earth Day and/or National Environment Day. Most of the countries commemorate and participate in activities as part of International Coastal Clean-up Day. Eighteen Caribbean countries and 10,472 persons took part in the 2003 international coastal clean-up.

38. The United States has a number of marine litter and debris activities. For example, both the National Oceanic and Atmospheric Administration (NOAA) and the Environmental Protection Agency work in close collaboration with State and local governments and NGOs to sponsor and participate in national and local beach clean-ups. Examples of such activities include: (a) in 2004, NOAA implemented a project in Puerto Rico to reduce marine debris caused by discarded fishing lines; (b) the International Coastal Clean-up is the largest volunteer environmental data-gathering effort and associated clean-up of coastal and underwater areas in the world. It takes place every year on the third Saturday in September. In 2001, over 140,000 people across the United States participated in the clean-up. They removed about 3.6 million pounds (1,600 tonnes) of debris from more than 7,700 miles (12,320 km) of coasts, shorelines and underwater sites; (c) the National Marine Debris Monitoring Program is designed to gather scientifically valid marine debris data following a rigorous statistical protocol. This scientific research is carried out every 28 days by teams of volunteers at randomly selected study sites along the United States coastline.

South Pacific Regional Environment Programme

39. Waste management is one of the major environmental issues within the Pacific region. Marine debris comes from both land and ship-based sources. All countries have activities in this field, including improving infrastructure, strengthening regulatory mechanisms, management procedures, raising awareness and education. These are undertaken as part of bilateral programmes or as internally funded national activities by national and local governments, the private sector and NGOs.

40. A number of regional programmes are being undertaken that address waste management, including the drafting of a regional waste management strategy and work programme, and community-based waste management projects as part of the International Waters Programme. Ship-based marine debris from commercial shipping has been addressed by assisting countries to put in place arrangements to manage ships' waste. A review of ships' waste management has been undertaken. The fishing industry is a major contributor to marine debris. The South Pacific Regional Environment Programme and Secretariat of the Pacific Community have collaborated in putting together and distributing awareness-raising materials. A training programme on marine environment protection was formulated and is used by the national Maritime Training and Fisheries Institutes in the region.

Regional Organization for the Protection of the Marine Environment (ROPME) — Kuwait Convention region

41. In the ROPME Sea Area (the Kuwait Convention region), litter is an increasing problem, generated from land, shore and ship-based activities. The waste from ship-based activities alone is estimated at 1.2 to 2.6 kg/person/day, most thrown overboard (Anbar, 1996). The coastline of the ROPME Sea Area is also being used as a repository for large quantities of industrial, commercial and residential trash and other solid waste. In the area, litter is found in the form of plastics, metal containers, wood, abandoned fishing gear, broken fishing nets, tyres and even entire automobiles in certain places. Oil sludge constitutes the most important type of solid waste in terms of quantity (Linden et al., 1990). Anthropogenic activities and accumulation of solid wastes (e.g. discarded fishing nets, traps, anchors, debris and tyres) can be a threat to the marine habitats, creating anoxic conditions for benthic fauna and having a negative impact throughout the marine ecosystem.

42. "Ghost fishing" by lost or abandoned fishing gear has been found in the ROPME region. Lost fishing nets and traps, as has been pointed out, can "ghost fish" for a long period. The negative impact of abandoned fishing nets, especially gill nets on coral reefs, is tremendous and has been recorded in the region (State of the Marine Environment Report, 2003). Discarded and abandoned fishing nets are catching and killing marine turtles. In the sea, the nets drown turtles. On nesting beaches, they entangle young ones (Ross, 1987). No regular regional or national scientific data is available on lost or discarded fishing gear. Nor is there any estimate of the loss to the economy owing to "ghost fishing".

V. Possible ways forward

43. The information gathered and analysis made within the framework of the UNEP Regional Seas feasibility study on sustainable management of marine litter demonstrates that marine litter, while currently addressed in a variety of contexts by a number of knowledgeable and efficient entities, continues to pose a serious threat to the environment and sustainable development. Strengthening and expanding the efforts of these entities (as discussed above) as they act in their respective global and regional contexts could greatly enhance their efforts to diminish the marine litter problem. Moreover, greater coordination and cooperation among them could be the most powerful means of ensuring that the battle against marine litter is waged in a comprehensive and effective manner.

44. There are a number of potential modalities for strengthening cooperation among the relevant entities (including United Nations bodies, conventions and agreements, national Governments, NGOs and others). Ad hoc and bilateral cooperative efforts can be effective, but a more streamlined approach, including a steering/coordinating committee, composed of United Nations agencies, Regional Seas Programmes and relevant representation of NGOs and private sector organizations, could also be used.

45. Such a committee could decide on priorities and coordinated activities, with all partners being responsible, jointly and individually, for the mobilization of funds and implementation of global, regional and sectoral activities. Activities could include: (a) information outreach and fund-raising; (b) building ownership and

partnerships; and (c) global, regional and national activities, as well as activities to be undertaken within specific relevant sectors.

46. UNEP GPA, IMO, FAO, the Basel Convention, IOC, Regional Seas Conventions and Action Plans and other concerned global and regional organizations as well as the numerous NGOs could all play an important role in such a coordinated attack on marine litter, given their varied and respective unique expertise and knowledge of different aspects of the matter.

47. Regardless of the structure of any coordinated action taken, a large number of potential actions to strengthen marine litter-related efforts have been identified by various expert organizations that were consulted during the compilation of the UNEP feasibility study, including, inter alia:

- Development of guidelines for management of marine litter at the regional and national levels
- Development of sectoral guidelines, e.g., guidelines for tourism, boating, diving, cruise lines, coastal construction and fisheries. Guidelines for marine excursion providers (diving, boating, recreational fisheries and wildlife watching)
- Development of "responsible citizenship" guidelines for different target audiences, in particular children and tourists. Practical demonstration through awareness-raising campaigns in selected destinations and with selected tourism companies
- Assessment of gaps and needs related to marine litter in selected regions and development of activities aimed at improving the situation. These could be used as pilot projects
- Assessment of the general effectiveness of annex V to the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78) (IMO)
- Assessment of the effectiveness of the implementation of the MARPOL 73/78 annex V Special Area provisions in the Mediterranean, the Wider Caribbean and the North Sea regions
- Evaluation of those parts of the FAO Code of Conduct for Responsible Fisheries that deal with lost or discarded fishing gear
- Evaluation of those parts of the FAO Code of Conduct for Responsible Fisheries that deal with management of wastes from fishing vessels that are included in annex V to MARPOL 73/78
- Inclusion of marine litter in global and regional environmental assessments
- Improvement of port reception facilities and better waste management
- Monitoring of compliance with no-dumping regulations for plastics
- Evaluation of a strategy for environmentally sound management of hazardous and other wastes, such as lead acid batteries and biomedical and health-care wastes, for impacts on the marine environment

- Increasing local planning and management capacity to avoid location of waste dump sites near coastlines or waterways or to prevent litter from escaping into the marine and coastal environment
- Formulation and implementation of improved solid waste management programmes in small rural communities to prevent litter from escaping into rivers and the marine and coastal environment
- Establishment of campaigns and/or permanent services for collecting solid wastes that pollute marine and coastal areas
- Long-term and well-designed research and monitoring programmes and studies in order to detect and determine statistically significant trends in the composition, quantities and effects of marine litter globally and regionally
- Support to organized beach surveys and beach clean-up activities by NGOs.

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